WHAT IS CLAIMED IS:

1. A method for detecting the presence of a target myostatin variant nucleic acid sequence in a nucleic acid-containing specimen wherein the specimen is from a subject having increased muscle mass as compared to a subject having a wild-type nucleic acid sequence or having a predisposition for increased muscle mass, said method comprising:

a) isolating nucleic acid present in the specimen; and

b) detecting the presence of the target myostatin variant nucleotide sequence, wherein the presence of the variant target nucleotide sequence is indicative of a predisposition for increased muscle mass or increased muscle mass.

2. The method of claim 1, further comprising amplifying the nucleic acid after step a).

3. The method of claim 2, wherein the amplification is by means of oligonucleotides which hybridize to the flanking regions of the target nucleic acid.

4. The method of claim 1, wherein the variant target nucleic acid comprises a mutation, a restriction fragment length polymorphism, a nucleic acid deletion, or a nucleic acid substitution.

5. The method of claim 4, wherein the nucleic acid deletion is an 11 base pair deletion consisting of nucleotides 937-947 of the myostatin gene.

6. The method of claim 4, wherein the mutation is a G to A substitution at nucleotide 1056 of the myostatin gene.

7. The method of claim 3, wherein the nucleotide sequence of the flanking regions to which the oligonucleotides hybridize is:

5'-GATCCCAAAACACTCTCCTACCTCGGATCCGCG-3' (SEQ ID NO:1);

and

5'-CCCCTCAACAATTTTGAAACTGTGGGATCCGCG-3' (SEQ ID NO:2).

8. The method of claim 7, wherein the oligonucleotides are:

5'-CGCGGATCCGAGGTAGGAGAGTGTTTTGGGATC-3' (SEQ ID NO:3);

and

5'-CGCGGATCCCACAGTTTCAAAATTGTTGAGGGG-3' (SEQ ID NO:4).

9. The method of claim 1, wherein the target nucleic acid is detected using a nucleic acid hybridization probe.

10. The method of claim 9, wherein the target nucleic acid to which the nucleic acid hybridization probe hybridizes is selected from:

5'-GTGGAGTGTTCAT-3' (SEQ ID NO:5);

5'-GATTCTGTCACAA-3' (SEQ ID NO:6);

5'-AATTCACATTCTC-3' (SEQ ID NO:7); or

5'-AATTCATATTCTC-3' (SEQ ID NO:8).

11. The method of claim 9, wherein the nucleic acid hybridization probe is selected from:

5'-ATGAACACTCCAC-3' (SEQ ID NO:9);

5'-TTGTGACAGAATC-3' (SEQ ID NO:10);

5'-GAGAATGTGAATT-3' (SEQ ID NO:11); or

5'-GAGAATATGAATT-3' (SEQ ID NO:12).

12. The method of claim 1, wherein the specimen is selected from the group of species consisting of avian, bovine, ovine, piscine, murine, and porcine.

13. The method of claim 12, wherein the species is bovine.

14. The method claim 12, wherein the specimen is a food product.

15. A kit useful for the detection of a target nucleic acid sequence in a specimen from a subject having increased muscle mass as compared to a subject having a wild-type nucleic acid sequence or having a predisposition for increased muscle mass, wherein the presence of the target nucleic acid sequence in the specimen is indicative of having or predisposed to having increased muscle mass, the kit comprising carrier means being compartmentalized to receive in close confinement therein one or more containers comprising a first container containing a nucleic acid hybridization probe, wherein the probe hybridizes to a target nucleic acid selected from the group consisting of:

5'-GTGGAGTGTTCAT-3' (SEQ ID NO:5);

5'-GATTCTGTCACAA-3' (SEQ ID NO:6);

5'-AATTCACATTCTC-3' (SEQ ID NO:7);

5'-AATTCATATTCTC-3' (SEQ ID NO:8); and

a second container containing a means for detecting hybridization of the probe with the target nucleic acid.

16. The kit of claim 15, wherein the nucleic acid hybridization probe is selected from the group consisting of:

5'-ATGAACACTCCAC-3' (SEQ ID NO:9);

5'-TTGTGACAGAATC-3' (SEQ ID NO:10);

5'-GAGAATGTGAATT-3' (SEQ ID NO:11); and

5'-GAGAATATGAATT-3' (SEQ ID NO:12).

17. The kit of claim 15, further comprising an amplification polymerase and deoxyribonucleotide(s).

18. The kit of claim 15, wherein the detectable means is selected from the group consisting of enzymes, chemiluminescers, radionuclides, fluorescent compounds, heavy metals and ligands.

19. The kit of claim 15, further comprising a third container containing oligonucleotides which hybridize to the flanking regions of a target nucleic acid, wherein the oligonucleotides hybridize to a nucleic acid having a sequence of:

5'-GATCCCAAAACACTCTCCTACCTCGGATCCGCG-3' (SEQ ID NO:1);

5'-CCCCTCAACAATTTTGAAACTGTGGGATCCGCG-3' (SEQ ID NO:2).

20. The kit of claim 19, wherein the oligonucleotides are:

5'-CGCGGATCCGAGGTAGGAGAGTGTTTTGGGATC-3' (SEQ ID NO:3);

and

5'-CGCGGATCCCACAGTTTCAAAATTGTTGAGGGG-3' (SEQ ID NO:4).

21. A kit useful for the detection of a target nucleic acid sequence in a specimen from a subject having increased muscle mass as compared to a subject having a wild-type nucleic acid sequence or having a predisposition for increased muscle mass, wherein the presence of the target nucleic acid sequence in the specimen is indicative of having or predisposed to having increased muscle mass, the kit comprising carrier means being compartmentalized to receive in close confinement therein one or more containers comprising a first container containing oligonucleotides which hybridize to the flanking regions of a target nucleic acid, wherein the oligonucleotides hybridize to a nucleic acid having a sequence of:

5'-GATCCCAAAACACTCTCCTACCTCGGATCCGCG-3' (SEQ ID NO:1);

5'-CCCCTCAACAATTTTGAAACTGTGGGATCCGCG-3' (SEQ ID NO:2).

22. The kit of claim 21, wherein the oligonucleotides are:

5'-CGCGGATCCGAGGTAGGAGAGTGTTTTGGGATC-3' (SEQ ID NO:3);

and

5'-CGCGGATCCCACAGTTTCAAAATTGTTGAGGGG-3' (SEQ ID NO:4).

23. A kit useful for the detection of a variant myostatin polypeptide in a specimen from a subject having increased muscle mass as compared to a subject having a wild-type nucleic acid sequence or having a predisposition for increased muscle mass, the kit comprising carrier means being compartmentalized to receive in close confinement therein one or more containers comprising a container containing an antibody which binds to amino acid residues 1-273 of wild-type myostatin polypeptide.

24. A kit useful for the detection of a variant myostatin polypeptide in a specimen from a subject having increased muscle mass as compared to a subject having a wild-type nucleic acid sequence or having a predisposition for increased muscle mass, the kit comprising carrier means being compartmentalized to receive in close confinement therein one or more containers comprising a container containing an antibody which binds to amino acid residues 274-375 of wild-type myostatin polypeptide.